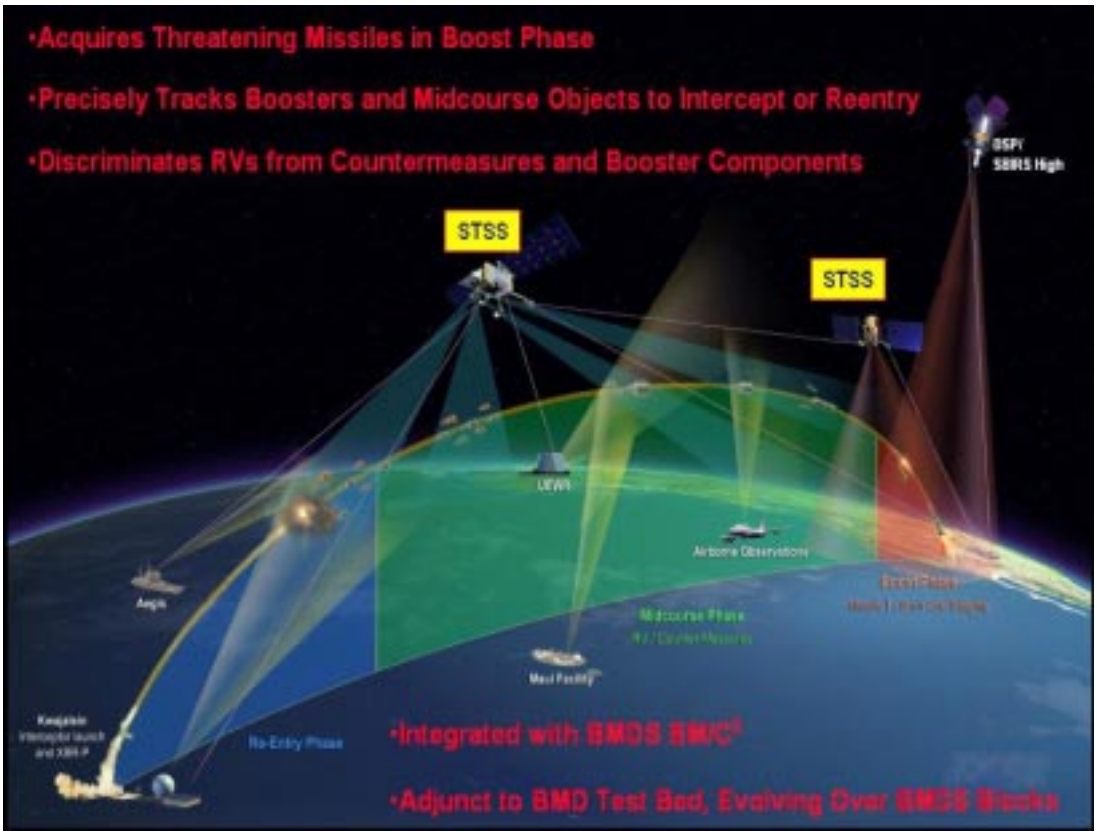
MISSILE DEFENSE AGENCY
MDA In-depth
Making Ballistic Missile Defense A Reality...

Space Tracking and Surveillance System (STSS)

Introduction



In FY02 the SBIRS-Low program was restructured to reduce risk and fully incorporate the program into the MDA's approach of building missile defenses through a series of steps, building incrementally on demonstrated capabilities. The resulting program has been renamed the Space Tracking and Surveillance System (STSS). STSS is being pursued as part of the Missile Defense Agency's process of exploring a variety of methods to detect incoming ballistic missiles and pass this information to interceptors. These multiple approaches reduce overall system risk. MDA is investigating a combination of radar and optical sensor alternatives on land-, sea-, air- and space-based platforms of which STSS is one component

Description

STSS will develop a series of interoperable Research and Development (R&D) satellites and supporting ground equipment for the detection and tracking of ballistic missiles. Data from STSS will be used to allow the BMDS interceptors to pick out the warhead of an incoming missile from other nearby objects such as decoys. As technology matures and as lessons are learned from the first satellites, more capable satellites will be designed and launched.

STSS will demonstrate key data processing and communication functions through the STSS Surrogate Test Bed (SSTB). The SSTB is a low cost, primarily Government effort to integrate existing data collected from ground and airborne data collection assets, and emulating STSS sensors using an initial configuration of the STSS ground station. The SSTB will participate in MDA flight tests, to test tracking and discrimination software and exercise the communication interface into the Ballistic Missile Defense System's Command, Control, Battle Management and Communication system.

Initial Satellites

In support of the Missile Defense Agency's Block 2006 Test Bed (a collection of components, short of an operational system, that will allow large scale, realistic testing) the first two STSS satellites will be launched. They will use existing hardware to contribute a low risk meaningful capability to the Test Bed. The initial satellites will demonstrate the ability to detect and, track incoming missiles and distinguish between the warhead and other nearby objects with space-based infrared sensors and pass this information to BMDS interceptors. Data from the initial satellites will be integrated into the command, control, battle management and communication (C2BMC) element. Northrop Grumman Space Technology (NGST) (formerly TRW) is on contract to deliver these satellites and to work with MDA on the definition of the desired capabilities of the next satellites.

The current plan is for the first two satellites to be launched on a single Delta II launch vehicle in FY07. Subsequent satellites will be launched on the Air Forces's standard launch vehicle, the Evolved Expendable Launch Vehicle (EELV).

STSS expands the BMDS Test Bed into space and provides the proof-of-concept for key STSS functions including processing and integrating data from multiple sources and passing this data to radars over the horizon and providing information on missile location to BMDS interceptors.

Future Satellites

New technologies will be inserted into subsequent R&D satellites, reducing the associated schedule risk and demonstrating increasing capability. Incremental improvements can be expected in the areas of satellite lifetime, infrared sensors and sensor subsystems, data processing software, communications, and BMC2 integration. MDA is working to define the capability goals of the program beyond the initial satellites.

The eventual operational system constellation size will be determined as the technology matures and is proven. Recent analysis has shown the value of a relatively small constellation (9-12) to ensure satellite-to-satellite communications. Increased coverage of key threat regions could be attained with a somewhat larger constellation (18-20) and worldwide coverage with an even larger constellation (25-30).

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http://www.acq.osd.mil/bmdo/bmdolink/html/

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